DEVELOPING AND IMPLEMENTING AN EFFECTIVE RAPID INTERVENTION CREW/RAPID INTERVENTION TEAM PROGRAM FOR THE CITY OF RENO FIRE DEPARTMENT

EXECUTIVE DEVELOPMENT

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Appendices Not Included. Please visit the Learning Resource Center on the Web at http://www.lrc.dhs.gov/ to learn how to obtain this report in its entirety through Interlibrary Loan.

ABSTRACT

This applied research project addressed the problem of the Reno Fire Department operating without a formal rapid intervention crew or rapid intervention team (RIC/RIT) program. Operating without a formal RIC/RIT program subjected Reno fire fighters to unnecessary risk and left Reno incident commanders without the tools needed to effectively control an incident in which a member of the department becomes lost, trapped, or injured.

The purpose of this applied research project was to identify the regulations, elements and training needed to develop and implement an effective RIC/RIT program for the City of Reno Fire Department.

Action research was the research method used. Information sources included books, periodicals, codes and regulations from federal agencies and national organizations, and other fire departments' policies and training programs

Project research questions:

1. What are the National Standards for RIC/RIT?

2. Identify what are the needed elements for an effective RIC/RIT program?

3. Identify what training is required to effectively implement a RIC/RIT program?

Procedures included a review of materials to obtain a basic understanding of RIC/RIT. Objectives were established for each research question. Questions on national standards and needed elements of RIC/RIT were answered from the research materials. The question on what training is required was answered through a number of personal interviews and research on the training materials.

It was recommended, and as a result of this project, a RIC/RIT program was developed and implemented by the Reno Fire Department. With an effective RIC/RIT program, the Reno

Fire Department is in compliance with national codes and regulations, and most importantly, is providing a safer work environment. The research found that an effective RIC/RIT program should be based on the latest National Fire Protection Association code and contain a number of interdependent elements which together provide the tools needed to manage an entire emergency incident. To implement an effective RIC/RIT program, training must include initial and continual training at all levels within the organization.

TABLE OF CONTENTS

PAGE

INTRODUCTION

The problem was that the Reno Fire Department was operating without a formal rapid intervention crew or rapid intervention team (RIC/RIT) program. Operating without a formal RIC/RIT program subjected Reno fire fighters to unnecessary risk and did not give Reno incident commanders the tools needed to effectively control an incident in which a member of the department became trapped, lost, or injured.

The purpose of this applied research project was to identify the regulations, elements and training needed to develop and implement an effective RIC/RIT program for the City of Reno Fire Department.

The research method used in this applied research project was Action Research. The research approach was to review information sources to answer the research questions. Information sources include: books, periodicals, codes and regulations from federal agencies and national organizations, and other fire departments' policies and training programs.

Project research questions:

1. What are the National Standards for RIC/RIT?
2. What are the needed elements for an effective RIC/RIT program?
3. What training is required to effectively implement a RIC/RIT program?

The information gained through this research was used to develop and implement an effective RIC/RIT program for the City of Reno Fire Department.

BACKGROUND AND SIGNIFICANCE

The Reno Fire Department is presently operating without a formal RIC/RIT program. At working incidents, the Reno incident commanders have been assigning the RIC/RIT function to individual truck or engine companies. With no standard written procedures or department wide training program standardizing the operational procedures and responsibilities of the RIC/RIT, RIC/RIT operations have been inconsistent from company to company and there has been confusion which has led companies and individuals to freelance. Additionally, without standard procedures and training on RIC/RIT, the incident commander (IC) of an incident in which a member of the department becomes trapped, lost, or injured is without the management tools needed to effectively control the dynamics of this type of challenging situation. The IC will need to create these management tools by the seat-of-the-pants method and during the most trying of times (Norman, 1993). This lack of pre-planned management tools results in loss of critical rescue time to effectively deal with the situation.

Lack of standard procedures and department wide training on RIC/RIT places Reno fire fighters operating at working incidents at an unnecessary risk to injury or death if they become trapped, lost, or injured. It also leaves the IC inadequately prepared to effectively and successfully control the very stressful and emotional situation of having trapped, lost, or injured fire fighters.

The significance to the Reno Fire Department of this research project is that the information gained will be used to develop and implement an effective a RIC/RIT Program. An effective RIC/RIT program will greatly increase the possibility for survival of Reno fire fighters operating at working incidents who become lost, trapped, or injured. The National Institute for

Occupational Safety and Health (NIOSH), National Fire Protection Association (NFPA) and Occupational Safety and Health Administration (OSHA) all have recommendations and standards covering RIC/RIT. By developing and implementing a RIC/RIT program based on the recommendations and standards of these agencies, along with the information gained through this applied research, the Reno Fire Department will be complying with federal regulations and recommendations and, more importantly, providing a safer work environment.

Research, development, and implementation of a RIC/RIT program for the Reno Fire Department will require organizational and cultural change starting from the top down. Luckily, within the Reno Fire Department there is very little cultural resistance to a formal RIC/RIT program. In fact, with the present confusion about duties and responsibilities of companies assigned the RIC/RIT function at fire incidents, a formal RIC/RIT program will be openly welcomed. Research has found that this is not the case with other fire departments across the country. There has been open resistance to RIC/RIT in many fire departments across the United States (Cobb, 1998; Spaulding, 1997). Organizational and cultural change within the Reno Fire Department via development and implementation of at RIC/RIT program relates to section 7 “Organizational Culture” of the Executive Development curriculum in the Executive Fire Officer Program (U.S. Fire Administration, 1998).

The applied research project’s purpose, of developing and implementing a RIC/RIT program for the Reno Fire Department, supports the United States Fire Administration’s operational objective of reducing the loss of lives of fire fighters from fire (U.S. Fire Administration, 1998).

LITERATURE REVIEW

The literature review for this research project is divided into three sections. Each section will address one of the research questions and the literature review pertaining to that question.

1. What are the National Standards for RIC/RIT?

National codes and standards that refer to rapid intervention can be found with the National Institute for Occupational Safety and Health (NIOSH), the National Fire Protection Association (NFPA), and the Occupational Health and Safety Administration (OSHA). These organizations' recommendation may or may not apply statutorily to a particular fire service agency depending on the agency's state and other factors (Jakubowski & Morton, 2001).

In a phone interview with Jerry Burnette, Safety and Health Trainer with the State of Nevada OSHA, the following information was obtained. Nevada is an OSHA state, meaning that Nevada has its own state run OSHA division within the state government. Nevada OSHA standards are exactly the same as the federal standards, with the exception that any employer in the state with 10 or more employees must have a state approved safety plan in place. Bottom line, all federal OSHA regulations apply to the Reno Fire Department and Nevada OSHA has enforcement powers over these regulations (J. Burnette, personal communications, January 14, 2003).

In an interview with Larry Farr, Fire Marshal of the Reno Fire Department, information was obtained that many of the Reno Fire Department's general orders and written polices are based on NFPA codes. However, the Department has not formally adopted any NFPA codes. He stated the Reno Fire Department, in general, tries to follow the NFPA codes because the NFPA codes are the national standards that the Department will be held to in a court of law (L. Farr,

personal communication, December 15, 2002). Jakubowski & Morton (2001) go further on this point with NFPA and state “Fire departments must be familiar with their [NFPA] publications, as they are nationally recognized and accepted standards. NFPA documents can and have been utilized in civil cases to indicate what a “reasonable person” would do in a given fire situation” (p. 31).

Jakubowski & Morton (2001) gave the best description found on how the NIOSH, NFPA and OSHA have shaped the need and requirements for RIC/RITs and is the primary source leading to the information listed below.

NIOSH (1994) recommended that fire departments should

> Employ a buddy system whenever fire fighters wear SCBA’s [Figure 3.1]. Fire fighters who wear breathing apparatus should never enter a hazardous area alone. Two fire fighters should work together and remain in contact with each other at all times. Two additional fire fighters should form a rescue team that is stationed outside the hazardous area. The rescue team should be trained and equipped to begin a rescue immediately if any of the fire fighters in the hazardous area require assistance. A dedicated rapid-response team may be required if more than a few fire fighters are in the hazardous area. (p. 6)

NIOSH (1994) further recommended

> Fire departments should take the following steps to minimize the risk of injury and death to fire fighters during structural fire fighting: Ensure that the incident commander conducts an initial size-up and risk assessment of the incident scene before beginning interior fire fighting. Ensure that the incident commander always maintains accountability for all personnel at a fire scene both by location and function. Establish rapid intervention crews

(RICs) often called rapid intervention teams and make sure they are positioned to respond immediately to emergencies. Ensure that at least four fire fighters are on the scene before beginning interior fire fighting at a structural fire (two fire fighters inside the structure and two outside). (p. 6)

The same NIOSH 1999 Alert also states

The primary purpose for a RIC is to provide a dedicated and specialized team of fire fighters ready to rescue fire fighters who become trapped in a burning structure. A RIC is vitally important at a structure fire, as it provides the incident commander with a designated emergency team and thereby eliminates the need for reassigning other fire fighters to this duty during a critical period. The RIC's primary duty is to respond to emergencies in which fire fighters are trapped, lost, or disoriented in a burning structure. Under optimum conditions, a RIC should respond with the first alarm to eliminate later response time. The RIC should be equipped with full turnout gear, SCBAs, portable radios and lights, axes, forcible entry tools, hooks, and other equipment needed for the rescue effort. The RIC should report directly to the incident commander and be nearby to await rescue commands. A RIC should consist of at least two fire fighters, but the size and complexity of the incident dictates the size of the RIC. (p. 6)

In researching NFPA, the following codes and regulations were found to contain information and references on RIC/RIT:

NFPA 1006-*Standard for Rescue Technician Professional Qualifications,* 2000 Edition.

NFPA 1500-*Standard on Fire Department Occupational Safety and Health Program*, 2002 Edition.

NFPA 1561-*Standard on Emergency Services Incident Management System*, 2002 Edition.

NFPA 1710-*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,* 2001 Edition.

NFPA 1720-*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, 2001 Edition.

NFPA 1981-*Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services,* 2002 Edition.

NFPA 1710-*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,* 2001 Edition.

Of the NFPA codes listed above, NFPA 1500 and 1561 had the most specific information relating to the subject of this research. The 2002 Edition of NFPA 1500, Chapter 8-*Emergency Operation,* directly addresses RIC/RIT with the following:

8.5 Rapid Intervention for Rescue of Members.

8.5.1 The fire department shall provide personnel for the rescue of members operating at emergency incidents.

8.5.2 A rapid intervention crew/company shall consist of at least two members and shall be available for rescue of a member or a crew.

8.5.2.1 A rapid intervention crew/company shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and any specialized rescue equipment that could be needed given the specifics of the operation under way.

8.5.3 The composition and structure of a rapid intervention crew/company shall be permitted to be flexible based on the type of incident and the size and complexity of operations.

8.5.4 The incident commander shall evaluate the situation and the risks to operating crews and shall provide one or more rapid intervention crew/company commensurate with the needs of the situation.

8.5.5 In the early stages of an incident, which includes the deployment of a fire department's initial attack assignment, the rapid intervention crew/company shall be in compliance with 8.4.11 and 8.4.12 and be either one of the following:

(1) On-scene members designated and dedicated as rapid intervention crew/company

(2) On-scene members performing other functions but ready to re-deploy to perform rapid intervention crew/company functions

8.5.5.1 The assignment of any personnel shall not be permitted as members of the rapid intervention crew/company if abandoning their critical task(s) to perform rescue clearly jeopardizes the safety and health of any member operating at the incident.

8.5.6 As the incident expands in size or complexity, which includes an incident commander's requests for additional resources beyond a fire department's initial attack assignment, the dedicated rapid intervention crew/company shall on arrival of these additional resources be either one of the following:

(1) On-scene members designated and dedicated as rapid intervention crew/company

(2) On-scene crew/company or crews/companies located for rapid deployment and dedicated as rapid intervention crews

8.5.6.1 During fire fighter rescue operations each crew/company shall remain intact.

8.5.7 At least one dedicated rapid intervention crew/company shall be standing by with equipment to provide for the rescue of members that are performing special operations or for members that are in positions that present an immediate danger of injury in the event of equipment failure or collapse (NFPA 1500, 2002).

NFPA 1561-*Standard on Emergency Services Incident Management System*, 2002 Edition, directly addresses RIC/RIT in Chapter 3 *Definitions*, Section 3.3.24 as follows

3.3.24* Rapid Intervention Crew/Company (RIC). A minimum of two fully equipped personnel on-site, in a ready state, for immediate rescue of injured or trapped personnel (NFPA 1561, 2002).

In NFPA 1561, Annex A-*Explanatory Material*, Section 3.3.24 further explains RIC/RIT:

A.3.3.24 Rapid Intervention Crew/Company (RIC). In some departments they can also be known as a rapid intervention team. At wildland incidents this crew designation would be addressed through the planning process and contingency planning.

Emergency services personnel respond to many incidents that present a high risk to personnel safety. Departments in compliance with OSHA 29 CFR 1910.134 “Respiratory Protection Regulations” need to have a minimum of two persons on scene fully equipped when members are operating in an Immediately Dangerous to Life and Health (IDLH) or

potentially IDLH atmosphere. The primary purpose is the rescue of injured, lost, or trapped fire fighters. Departments utilizing an incident management system in accordance with NFPA 1561, *Standard on Emergency Services Incident Management System*, or 29 CFR 1910.120, along with a personnel accountability system, have incorporated the RIC into their management system. Many departments have redefined their response plans to include the dispatch of an additional company (engine, rescue, or truck) to respond to incidents and stand by as the rapid intervention crew/company. Incident commanders can assign additional RICs based on the size and complexity of the incident scene. This requirement is also included as part of special operations incidents in NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* (NFPA 1561, 2002).

In researching the OSHA regulations, it was found that Standard 29 CFR 1910.134 - *Respiratory Protection*, directly addresses fire fighting and RIC/RIT. The following are the pertinent sections of the OSHA (1998) Standard:

(g)(4) *Procedures for interior structural firefighting.* In addition to the requirements set forth under paragraph (g)(3), in interior structural fires, the employer shall ensure that:

(g)(4)(i) At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times;

(g)(4)(ii) At least two employees are located outside the IDLH atmosphere; and

(g)(4)(iii) All employees engaged in interior structural firefighting use SCBAs.

Note 1 to paragraph (g): One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any fire fighter working at the incident.

Note 2 to paragraph (g): Nothing in this section is meant to preclude fire fighters from performing emergency rescue activities before an entire team has assembled (OSHA, 1998).

OSHA's November 13, 1998 Interpretation of 1910.134(g)(4) to Mark Schultz, senior fire inspector for the Gallatin, Tennessee, Fire Department, further clarifies the requirement for the number of Standby personnel:

…the incident commander has the flexibility to determine whether more than two outside fire fighters are necessary when more than two fire fighters go inside. In a situation where the burning structure is very large, additional outside fire fighters may be warranted to ensure effective assistance and rescue. For example where the fire fighting involves entry from different locations or levels, two outside fire fighters may have to be stationed at each point of entry. You also asked whether standby personnel had to wait for additional standby personnel before entering to attempt a rescue of fire fighters in a structural fire. No. There is an explicit exemption in the Respiratory Protection Standard that if a life is in jeopardy, the two-in/two out requirement is waived. The incident commander and the fire fighters at the scene must decide whether the risks posed by entering an interior structural fire prior to the assembly of at least four fire fighters is outweighed by the need to rescue victims who are at

risk of death or serious physical harm. There is no violation of the standard under rescue circumstances (OSHA, 1998).

The following is an interesting side note not directly related to the research and was obtained from an interview with the past president of Truckee Meadow Fire Protection District Fire Fighter's Local 2487, John Judge. In July of 2000 the Reno Fire Department consolidated with Truckee Meadows Fire Protection District by a contractual agreement. Truckee Meadows employees became Reno Fire Department employees and the Reno Fire Department now provides and administers fire protection to the Truckee Meadows Fire Protection District. The national OSHA 2-in-2 out rule became law partially as a result of an OSHA complaint filed against the Truckee Meadow Fire Protection District by the three Truckee Meadows Fire fighters in 1994. This case went through the Nevada State OSHA system, was heard by the Federal Ninth District Court of Appeal in San Francisco which referred the case the Federal OSHA office in Washington D.C. In response to this case and other factors Federal OSHA issued the 2-in-2 out rule (J. Judge, personal communications, February 18, 2003). The interesting point here is the OSHA 2-in-2 out rule had its birth here in the Reno area.

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2. What are the needed elements for an effective RIC/RIT program?

NFPA 1500 (2002) Chapter 8, *Emergency Operations*, like NIOSH's 1999 alert , makes recommendations for emergency operations to "be conducted in a manner that recognizes hazards and prevents accidents and injuries". Section 8.5 *Rapid Intervention for Rescue of Member*s, addresses RIC/RIT and is listed above. Additional sections of Chapter 8 list elements of emergency operations that must be in place to manage an incident and have an effective

RIC/RIT. The following is a list of the identified elements needed for an effective RIC/RIT from Chapter 8:

- 8.1.2 Establish an incident management system.
- 8.1.9 Establish a fire dispatch and communication system.
- 8.1.10.2 Establish an “emergency traffic” procedure.
- 8.1.12 & 8.1.12.1 Establish an incident clock with dispatch center giving 10-minute increments.
- 8.2.1 Integrate risk management into the regular functions of incident command.
- 8.2.5 Assign an incident safety officer.
- 8.3.1 Establish a personnel accountability system.
- 8.4.7 Establish procedures of the “initial stages” of an incident and follow the 2-in-2 out OSHA rule.
- 8.4.16 Establish a RIC with second assigned crew.
- 8.4.21 Have standby emergency medical care.
- 8.6.1 Provide for rehabilitation of member operating at incidents.
- 8.8.1 Provide for post-incident analysis (NFPA 1500, 2002).

Dunn (1999) pointed out that an “Emergency Withdrawal” is the most serious type of evacuation and should be activated by a prearranged signal. Dunn States “When a fire fighter hears this signal, he should drop all tools and report outside to an officer for a roll call. Results of the head count should be reported to the command post. An emergency withdrawals will clear the building of personnel and allow for a more orderly rescue operation by the RIT for any missing members” (p. 262).

Coleman and Lasky (2000) point out that while much energy has been spent on RIC/RIT procedures and training fire fighters to be effective RIC/RIT members, not much effort has been given on preparing the IC to manage the Mayday incident. Some of the recommendations they make to assist the IC in managing a Mayday are:

- Have common terminology for declaring a Mayday situation
- Clear all non-emergency radio traffic
- Establish multiple frequencies to more effectively manage the incident communications with separate frequencies for RIC/RIT, the fire, and command
- Evaluate manpower needs of the incident, to support the RIC/RIT operation and its possible technical and logistical needs
- Support the continuing fire operations
- Support command and support the critical incident stress needs and welfare of the crews
- Make requests of additional emergency medical support
- Plan how to effectively deal with the psychology of high emotions, potential for mutinies and freelancing of crews.

Coleman & Lasky (2000) also encourage the development of a lost/trapped policy to help guide the IC through these tough incidents.

NIOSH (1999) advises that establishing a RIC/RIT is only one of eleven steps a fire department should follow to minimize the risk of injury and death to fire fighters during structural fire fighting. The following are the eleven steps recommended in this alert.

1. Implement and review occupational safety programs and standard operating procedures.

2. Ensure that the incident commander conducts an initial size-up and risk assessment of the incident scene before beginning interior fire fighting.

3. Ensure that the incident commander always maintains accountability for all personnel at a fire scene both by location and function.

4. Establish rapid intervention crews (RICs) often called rapid intervention teams and make sure they are positioned to respond immediately to emergencies.

5. Ensure that at least four fire fighters are on the scene before beginning interior fire fighting at a structural fire (two fire fighters inside the structure and two outside).

6. Equip fire fighters who enter hazardous areas (such as burning or suspected unsafe structures) to maintain two-way communications with the incident commander.

7. Ensure that standard operating procedures and equipment are adequate and sufficient to support radio traffic at multiple-responder fire scenes.

8. Provide all fire fighters with personal alert safety system (PASS) devices and make sure that they wear and activate them when they are involved in fire fighting, rescue, or other hazardous duties.

9. Conduct prefire planning and inspections that cover all building materials and components of a structure.

10. Transmit an audible tone or alert immediately when conditions become unsafe for fire fighters.

11. Establish a collapse zone around buildings with parapet walls. (p. 1)

These eleven steps are related to one another and, together, make structural fire fighting safer. RIC/RIT is a critical step; however, all eleven steps must be in place to have an effective RIC/RIT.

Brunacini (2002) addresses describes when the IC should activate a RIC, that the RIC must wear proper safety gear, have radio communications, have rescue tools and equipment at their immediate disposal, and be "on deck" to quickly perform a rescue. Additionally, Brunacini describes that the RIC is the center piece of the lost/trapped/missing fire fighter procedures. That there needs to be a "Mayday" radio sign for a lost/trapped/missing fire fighter to use. And, he says that a "Mayday" is a really big-deal that changes the incident's operations and threatens workers. He describes further that at a "Mayday" incident, the IC should: request another alarm, get a personnel accountability report (PAR) of all units, open exits to the structure, begin a search with the RIC, provide for fire control, ventilation and have medical support on hand. (p. 318)

In a review of numerous fire departments' written procedures on RIC/RIT, the author found that Phoenix Fire Department had the most comprehensive RIC/RIT procedure and RIC/RIT supporting procedures. The author was led to Phoenix's procedures by the reference in NFPA 1561, Annex C.2 *Risk Management during Emergency Operations* (NFPA 1561, 2002). Other departments' procedures included many of the elements for an effective RIC/RIT, but Phoenix's procedures had all the elements listed by the other departments and even went further. The elements for an effective RIC/RIT program are listed in the Results section of this project.

Crawford (1998) identified a number of elements needed for an effective RIC/RIT including: training on procedure and techniques, thermal image cameras, a RIT/RIC procedure,

tool and equipment list to be staged on a trap, list of duties for RIC/RIT to perform in preparation for rescue and assist in fire ground safety, need for some type of rescue air system, need for alarm upgrade with a Mayday call, need for aggressive ventilation and hose line placement to protect trapped fire fighter, need for additional teams, an accountability system and the need for critical incident stress debriefings. (p. 60)

Cobb (1998) listed factors that contribute to early injuries and deaths. The factors are: lightweight-wood-truss construction, energy-efficient windows, older buildings and lack of survival training. Cobb, like Crawford, identified the needed elements for an effective RIC/RIT. In his list of needed tools, he added that a search line be carried by each RIC/RIT member. He also stated, “The rapid intervention team can contribute to fire ground safety and assist the incident commander by monitoring fire ground traffic. The team can provide an extra set of eyes by watching the fire building for early signs of collapse which can be helpful during escalating incidents”. (p. 52)

Kolomay and Hoff (1998) developed an excellent and comprehensive RIC/RIT checklist that includes sections on size-up, tactics, equipment lists by construction type, and other RIC/RIT operations checks. They also point out that most of the RIC/RIT duties and needed equipment are part of basic truck company operations. (p. 12)

Mittendorf (1998) made the point that separate radio channels should be used for search and rescue teams, and that a RIC/RIT should be in place at each point a rescue team makes entry. Additionally, the RIC/RIT should monitor the primary search team as to location, progress, and air supply, and should place quartz lights or strobes at each entranceway. (p. 211)

3. What is the required training to effectively implement a RIC/RIT program?

Clark (2001, ¶ 11) made the point that Mayday procedures are an important part of fire fighter safety survival and a Mayday activates RIC/RIT into action. Clark also made the comparison of the decision making process of a fire fighter calling a Mayday to that of a Navy pilot's decision to eject. He stated that the Navy has an ejection doctrine and that the pilots are trained and retrained in both cognitive and psychomotor skills on ejection every 6 to 12 months. The Navy's ejection doctrine may serve as a model in teaching fire fighters the decision making process for the calling of a Mayday. In closing, Clark stated, "A fire fighter's decision to declare a Mayday is made in the fire station before they get on the apparatus. So, at your next company drill, ask this question. When would you call a Mayday?".

Crawford (1998) stated "Training is the key to success in rapid intervention team operations". He continued

> All aspects of rapid intervention team operations and fire fighter rescue must be practiced in training evolutions to increase speed and efficiency, from team preparation and search techniques to extrication and removal. In addition, the use of new technology in the fire service such as thermal imaging cameras needs to be incorporated into the rapid intervention team's inventory of equipment. (p. 60)

In this article, Crawford (1998) went further in explaining techniques and equipment needed in enlarging openings in buildings, of different construction types, to assist in the removal of a trapped or injured fire fighter. He also stressed the need for continuous training to ensure proficiency in these types of rapid intervention rescue techniques. (p. 62)

Lasky (1997) stated

> Many departments are implementing policies, procedures, and guidelines pertaining to the RIT but are failing to train their personnel in this area. It's not uncommon to hear an

> officer or fighter say, 'We have a rapid intervention team policy, but we've never been trained on how to use it.' Even more important is the fact that many departments are over looking the need to train the officers who may head this team. Departments need to take a closer look at the roles and responsibilities of the RIT officer/team leader. (p. 17)

Lasky (1997) went on to describe the roles and responsibilities of the RIT officer at fire scenes prior to and during Mayday situations. (p. 17)

In a telephone interview with Phoenix Fire Assistant Chief Steve Kreis, Chief Kreis described Phoenix's history with instructing the RIC/RIT program. He stated that Phoenix has been using RIC/RIT for over ten years. Their initial training involved division level training with line and command staff personnel. The initial training included classroom instruction on the procedures and field and multi-company drills on rescue techniques using the procedure. For on-going training, Phoenix uses the RIC/RIT procedures in all company and multi-company drills. They have made the RIC/RIT concept part of the culture of the department. Recently, following the unfortunate fire ground death of fire fighter Bret Tarver, March 14, 2001, Phoenix Fire has changed its RIT/RIC training to a five part program, still including formal classroom instruction and using RIC/RIT on every company and multi-company drill. The new training puts an emphasis on improved air and SCBA management and includes rope and search work, primarily in large structures. Phoenix is very concerned with fire fighters operating in large structures due to the possibilities of the fire fighters over extending themselves and running out of air before they can exit the large building. Phoenix Fire is so concerned, that there is a movement, within their organization, to limit a fire fighter's advance into a large structure to a maximum of two hundred feet. Chief Kreis also stated that they have upgraded their commitment to RIC/RIT by increasing their automatic dispatch of resources to the rescue sector (RIC/RIT) of a working

incident from one company to the larger commitment of two engines, one truck, one rescue and a battalion chief (S. Kreis, personal communications, March 14 , 2003).

Main (1996) found that for a RIC/RIT to be successful there needs to be both specific training on RIC/RIT and survival training for fire fighters. Main found that there were no hard conclusions on what was the best type of method to delivery the training. He also found that in delivering RIC/RIT training, 46 percent of the departments that answered his survey responded that they utilized in-service training for all companies. (p. 32)

PROCEDURE

The purpose of this applied research was to develop and implement an effective a Rapid Intervention Team (RIC/RIT) Program for the City of Reno Fire Department. The research procedure used was action research. In order to accomplish this purpose the following objectives were developed:

1. Gather and research the general subject of RIC/RIT.
2. Identify the National Standards for RIC/RIT.
3. Identify what are the needed elements for an effective RIC/RIT program.
4. Identify what training is required to effectively implement a RIC/RIT program.

The information obtained from the above objectives was used to develop the written procedures (see Appendix A) and training program (see Appendix B) that will be used to implement an effective RIC/RIT program for the City of Reno Fire Department.

To accomplish objective one, gathering and researching the general subject of RIC/RIT, the following was done. A search began with gathering available materials at the National Emergency Training Center, Learning Resource Center. The Learning Resource Center provided periodical articles, books, videos, training documents from national training organizations, applied research papers on the subject, and a list of abstracts of applied research papers available only from the author's on the subject of RIC/RIT. An attempt was made to contact these authors. Response and information was obtained from about half the authors contacted.

The subject of RIC/RIT is somewhat new in the fire service; a search was made of the most recently published fire service books. New books were found that were solely written on the subject, had chapters on RIC/RIT, or had information on RIC/RIT within the text. A search of the Reno Fire Department library produced lesson plans, power point programs, videos, and

other department procedures relating to RIC/RIT. These materials had been acquired over the last three years by members of the Reno Fire Department attending classes and seminars relating to RIC/RIT around the country. A basic review of these materials was conducted.

To accomplish objective two, identify the national standards for RIC/RIT, a search was conducted of the federal agencies and national code organizations that covered RIC/RIT and the national standards identified. The internet provided the majority of the material, covering this objective, used in the research. Additionally, personal interviews with local and state officials, and recently published books on RIC/RIT were used. The most useful and current information was obtained at the following three internet websites:

1. U.S. Department of Health and Human Service, Center for Disease Control and Prevention, National Institute for Occupational Safety and Health, www.cdc.gov/niosh/fire.html.
2. Occupational Safety and Health Administration, www.osha.gov.
3. National Fire Protection Association, www.nfpa.org.

To accomplish objective three, identify what are the needed elements for an effective RIC/RIT program, review of the following information was made: Recommendations from NIOSH's 1999 Alert on *Preventing Injuries and Deaths of Fire Fighters Due to Structural Collapse* (Publication No. 99-146), the 2-in-2 out rule by OSHA, NFPA codes relating to RIC/RIT, and other fire departments' RIC/RIT and RIC/RIT supporting procedures. From the review, elements for an effective RIC/RIT program were identified.

To accomplish objective four, identify what training is required to effectively implement a RIC/RIT program, a review of the following training materials was made: lesson plans, power point programs, and other fire departments' procedures relating to RIC/RIT. These training

materials had been acquired by members of the Reno Fire Department attending classes, and seminars, around the country over the last three years, from the National Emergency Training Center, Learning Resource Center, and training information in recently published books on RIC/RIT. Additionally, a number of telephone and personal interviews were conducted with officers of other fire departments on how they implemented RIC/RIT programs within their departments and what RIC/RIT training their departments do on an on-going basis. From the review and interviews, the required training to effectively implement a RIC/RIT program was identified.

Assumptions and Limitations

For this research project, it was assumed that the basic concept of a RIC/RIT will save fire fighter lives. Much has been written on the facts and figures of fire fighter fatalities and injuries that justify the need for a RIC/RIT. It would be redundant to attempt this work.

Limitations on this research project included the following: A 50% response rate from requests to obtain information from other Executive Fire Officer authors who wrote applied research projects on the subject not on file at the National Emergency Training Center Learning Resource Center. Federal and national organizations listed in the literature review with regulations and codes pertaining to RIC/RIT were limited to NIOSH, OSHA and NFPA. Much of the information gathered regarding what training is required to effectively implement a RIC/RIT program was completed via telephone conversations and personal interviews which are not reproducible.

Definition of Terms

Accountability System - A system using tags, keys or electronics devices to keep track of all personnel operating on a emergency incident by time, function and location.

Drop-bag - A bag of approximately 100’ to 150’ of 5mm to 8mm rope attached to a self contained breathing apparatus that is used for raising and lowering of tools and equipment and used for search and rescue activities.

Emergency Traffic - A priority message to be immediately broadcast throughout the fireground (Brunacini, 1985, p. 253).

Incident Commander (IC) – The individual responsible for the management of all incident operations.

Mayday - A radio message used by fire fighters to report their status as being in trouble and needing rescue (Phoenix Fire Department, n.d.).

Rapid Intervention Team/Rapid Intervention Crew (RIC/RIT) - A team of two (2) personnel minimum held in ready status, with protective gear and equipment, to make an immediate rescue effort on lost, trapped or injured personnel operating at emergency incidents

Safety Officer - A specialist who provides expertise and individual attention to supplement the role and responsibility of the fire ground commander for fireground safety (Brunacini, 1985, p. 255).

Self Survival - Set of procedures for lost, trapped, or injured fire fighters to follow to increase their chance for survival.

RIC/RIT Pack - A special bag of equipment carried by the RIC/RIT to supplement the air supply for the lost, trapped, or injured fire fighter. The bag can contain: an air bottle,

regular and mask, a special “transfill” connection for transferring air from SCBA pack to lost, or trapped workers’ SCBA pack, rescue rope, RIC/RIT equipment inventory tarp, lights, etc.

RESULTS

Four (4) objectives were established to accomplish the purpose to develop and implement an effective a Rapid Intervention Team (RIC/RIT) Program for the City of Reno Fire Department using action research.

The first object, to gather and research the general subject of RIC/RIT, was easily accomplished by a review of the many forms of information available on the subject. Prior executive officer authors, who have completed applied research on this subject, expressed frustration, in personal interviews, on the lack of information available. The author did not experience this frustration and found that in the last two years a large amount of new and comprehensive material has been produced on RIC/RIT.

The second object, identifying the national standards for RIC/RIT, produced the following results. National standards for RIC/RIT were found to be contained in the recommendations and regulations of NIOSH and OSHA and in the codes of NFPA. The author found that the latest 2002 Editions of NFPA 1500- *Standard on Fire Department Occupational Safety and Health Program*, and NFPA 1561- *Standard on Emergency Services Incident Management System* have incorporated the recommendations and regulations of NIOSH and OSHA, in regards to RIC/RIT, into the new NFPA code. Therefore, in order to be compliant with OSHA and follow the recommendations of NIOSH, the new NFPA codes should be used as the primary guideline in developing and implementing an effective RIC/RIT program. Additionally, the operating procedures of the Phoenix Fire Department on RIC/RIT and procedures relating to RIC/RIT, were found to be the best and most comprehensive of all fire department procedures researched. The Phoenix procedures are based on the newest NFPA code. NFPA even refers to the Phoenix procedures in the annex of NFPA 1561 (NFPA 1561, 2002). The Phoenix

procedures can be used as a template in developing a RIC/RIT program and modified to meet the man power, resources and existing polices of an individual department. In other words, there is no need to reinvent the wheel, just reshape it.

The third objective, to identify what elements are needed for an effective RIC/RIT program, turned out to be more involved than the author expected. It was found that a RIC/RIT is only one interrelated and interdependent element needed to effectively manage an emergency incident in which an emergency worker is lost, trapped, or injured. Therefore, to have an effective RIC/RIT program, all of the elements needed to effectively manage an entire emergency incident, must be in place, including a RIC/RIT. The following is the list of identified elements for an effective RIC/RIT program, obtained by the author from the information sources researched.

Elements from NFPA 1500

- Establish an incident management system.
- Establish a fire dispatch and communication system.
- Establish an “emergency traffic” procedure.
- Establish an incident clock with dispatch center giving 10-minute increments.
- Establish a personnel accountability system.
- Assign a incident safety officer.
- Establish procedures of the “initial stages” of an incident and follow the 2-in-2 out OSHA rule.
- Establish a RIC with second assigned crew.
- Have standby emergency medical care (NFPA1500, 2002).

Element from Vincent Dunn (1999)

- Establish an emergency withdrawal procedure.

Elements from Colman & Lasky (2000)

- Establish a Mayday procedure.
- Clear all non-emergency radio traffic.
- Establish multiple frequencies to more effectively manage the incident communications with separate frequencies for RIC/RIT, the fire, and command.
- Evaluate manpower needs of the incident, to support the RIC/RIT operation and its possible technical and logistical needs.
- Support the continuing fire operations.
- Support command and support the critical incident stress needs and welfare of the crews.
- Plan how to effectively deal with the psychology of high emotions, potential for mutinies, and freelancing of crews.
- Establish a lost/trapped policy.

Elements from NIOSH (1999)

- Ensure that the IC conducts an initial size-up and risk assessment of the incident scene before beginning interior fire fighting.
- Establish RIC/RIT and make sure they are positioned to respond immediately to emergencies.
- Equip fire fighters who enter hazardous areas (such as burning or suspected unsafe structures) to maintain two-way communications with the IC.

- Provide all fire fighters with personal alert safety system (PASS) devices and make sure that they wear and activate them when they are involved in fire fighting, rescue, or other hazardous duties.

Elements from Brunacini (2002)

- Establish lost/trapped/missing fire fighter procedures
- "Mayday" is a really big-deal that changes the incidents operations and threatens workers.

Elements from Phoenix Fire Department (n.d.)

- Establish fire fighter self survival policies.
- Establish dispatch policies to automatically dispatch RIC/RIT on notification of a working alarm and an additional alarm on notification of a Mayday.
- Ensure rescue tools are on scene and organized on pre-labeled equipment trap.
- Ensure a supplemental breathing air system on scene and available to the RIC/RIT.
- Ensure thermal image technology is on scene and available to the RIC/RIT.

Prior to the research, the Reno Fire Department had some elements/procedures in place for an effective RIC/RIT program. The elements/procedures in place included: ICS, Accountability, Emergency Egress, Drop-bag use, Thermal Imaging and Self Contained Breathing Apparatus (SCBA) RIC/RIT Pack. Elements/procedures to be gained by Reno Fire Department through this research project to develop and implement an effective RIC/RIT program are: Rapid Intervention Team Procedure, Lost/Trapped Fire Fighter Basic Self-Survival, Mayday, Rescue of Lost or Trapped Fire Fighters, RIC/RIT Duties/Size-Up Check List, RIC/RIT

Equipment Check List, Dispatch Procedures for Mayday, Emergency Traffic, Automatic Dispatch of Additional Company for RIC/RIT upon Notice of Working Incident, and a department wide RIC/RIT Training Program (See Appendix A-Reno Fire Department's new Emergency Operations and Communication Procedures relating to Rapid Intervention Teams).

The fourth objective, to identify what training is required to effectively implement a RIC/RIT program, produced the following findings. The concept of RIC/RIT must become part of the culture of the organization. The RIC/RIT training must be department wide, have initial intensive training, on-going refresher training and be an essential part of new recruit training. The training will require a large commitment of training resources and available training time. The RIC/RIT program must be accepted, promoted, and practiced by the command staff of the department for the program to be successful (See Appendix B-Reno Fire Department Rapid Intervention Team Training Program).

DISCUSSION

Discussion is divided into four (4) sections, three (3) addressing each research question and one (1) for general discussion.

1. What are the National Standards for RIC/RIT?

The national standards for RIC/RIT were found in the federal agencies of NIOSH and OSHA and the national code organization of NFPA. Recommendations from NIOSH were found in the September 1994 alert, *Preventing Injuries and Deaths of Fire Fighters* (Publication No. 94-125), and August 1999 alert, *Preventing Injuries and Deaths of Fire fighters Due to Structural Collapse* (Publication No. 99-146) (NIOSH, 1999). National recommended codes from NFPA addressing RIC/RIT were found primarily in the 2002 Editions of NFPA 1500-*Standard on Fire Department Occupational Safety and Health Program*, Chapter 8- *Emergency Operation* and NFPA 1561-*Standard on Emergency Services Incident Management System*, Annex A (NFPA, 2002). Regulations on RIC/RIT from OSHA were found in Standard 29 CFR 1910.134 - *Respiratory Protection* (OSHA, 1998).

The author found the recommendations of NIOSH and the regulations of OSHA to be a good start on identifying the national standards for RIC/RIT and clearly addressed the regulations regarding the 2-in-2 out rule. However, NFPA's new 2002 codes hit the nail on the head in regards to identifying the national standards for RIC/RIT. It was clear to the author that NFPA has incorporated both NIOSH and OSHA recommendations and regulations into the new code. In the author's opinion, the NFPA code is clearly the most comprehensive source for national standards relating to RIC/RIT at this time.

Organizational implications of this finding for the Reno Fire Department are, when developing and implementing a RIC/RIT program, compliance to the new NFPA code should be the main guideline used in developing the program.

2. What are the needed elements for an effective RIC/RIT program?

Elements needed for an effective RIC/RIT program were found in the following sources: 2002 Editions of NFPA 1500- *Standard on Fire Department Occupational Safety and Health Program*, Chapter 8-*Emergency Operation* and NFPA 1561- *Standard on Emergency Services Incident Management System*, Annex A (NFPA 1500 & 1561, 2002), NIOSH's August 1999 alert, *Preventing Injuries and Deaths of Fire fighters Due to Structural Collapse* (Publication No. 99-146) (NIOSH, 1999), J. Coleman's and R. Lasky's January, 2000 article in Fire Engineering on *managing the Mayday* (Coleman & Lasky, 2000), Brunacini's 2002 second Edition of *Fire command*, and the written operating procedures of the Phoenix Fire Department available on the Phoenix Fire Department website (Phoenix Fire Department, n.d.).

All of the above sources identified parts or elements needed to effectively manage emergency incidents, including incidents in which emergency workers become lost, trapped, or injured. All of the listed parts and elements are interrelated and interdependent on one another and must be in place simultaneously to effectively manage an incident. A RIC/RIT is only one interdependent element. Therefore it follows, and is the author's interpretation, that in order to have an effective RIC/RIT program, all of the identified elements needed to effectively manage an entire emergency incident need to be in place, including a RIC/RIT.

Organizational implications to the Reno Fire Department are, in order to have an effective RIC/RIT program, all identified elements need to be in place. Therefore, in developing a RIC/RIT program, additional procedures may need to be developed in addition to a RIC/RIT

procedure, to ensure all identified elements are in place within the Reno Fire Department's emergency operations and communication procedures

3. What is the required training to effectively implement a RIC/RIT program?

Information to identify required training to effectively implement a RIC/RIT program was found in the following sources: PowerPoint training programs from the Virginia Beach, Virginia and Phoenix, Arizona Fire Departments, RIC/RIT training documents from the California Department of Forestry and Illinois State Fire Training Academy. Additionally information was obtained from, personal and telephone interviews with other fire departments' training officers, who had implemented RIC/RIT programs. These interviews provided a historical perspective on RIC/RIT and were extremely useful in identifying required training for an effective RIC/RIT program.

The information sources identified that for an effective RIC/RIT program to be successfully implemented, the concept of RIC/RIT must become part of the culture of the organization. To make this happen, RIC/RIT training must be department wide, have initial intensive training, on-going refresher training and be an essential part of new recruit training. Department wide training includes all fire fighting, dispatch and command personnel. The initial intensive training should be broken down into review of new policies, roles and responsibilities of RIC/RIT, use of RIC/RIT equipment, RIC/RIT rescue techniques, and additional specialized training for dispatch and command personnel. On-going refresher training can be incorporated into multi-company drills and company level training. The initial intensive training should become part of the recruit academy curriculum.

Organizational implications to the Reno Fire Department to affect a cultural change of successfully implementing an effective RIC/RIT program will require a large commitment of training resources and available training time to instruct the department on the identified required RIC/RIT training. Additionally, it is the author's opinion, that the concept of RIC/RIT and the additional elements that support RIC/RIT must be accepted, promoted, and continually practiced by the command staff, and the incident commanders of the department, for the program to be successful.

4. General Discussion

Other Executive Fire Officer authors who have completed research projects on RIC/RIT expressed their frustration on the lack of available literature and materials on the subject of RIC/RIT, at the time they researched and wrote their projects (R. Snyder, personal communications, January 6, 2003), (T. Lambert, personal communications, December 15, 2002), (T. Spaulding, personal communications, December 15, 2002). This was not the case for the author. In the last two years, a number of new fire service books have been written on RIC/RIT or have addressed RIC/RIT in chapters of the book (Jakubowski & Morton, 2001; Brunacini, 2002). Numerous fire service periodicals with recent articles on RIC/RIT have been printed. In 2002, NFPA updated NFPA 1500- *Standard on Fire Department Occupational Safety and Health Program* (NFPA 1500, 2002). The new NFPA 1500 greatly expanded information and recommendations on RIC/RIT. Additionally, the internet was a great resource with access to government agencies, fire related organizations, specific fire department websites with contact numbers and department procedures, and fire related periodical articles, all with current information related to RIC/RIT.

Most of the periodical articles dated 1997 to 1999 dealt with justifying the need for RIC/RIT by analyzing fire department incidents with fire fighter deaths and injuries, or gave guidelines/training of the RIC/RIT in performing fire fighter rescue and items needed for an effective RIC/RIT. From 1999 to the present, the majority of literature on RIC/RIT has been on how RIC/RIT is one of many essential elements that must work together to ensure fire fighter safety during structural firefighting. Additionally, more emphasis has been placed on how the IC uses these essential elements as new tools to effectively manage the very stressful situation of having a lost, trapped, or injured fire fighter during interior structural fire fighting.

RECOMMENDATIONS

This applied research project addressed the problem of the Reno Fire Department operating without a formal rapid intervention crew or rapid intervention team (RIC/RIT) program. The purpose of this applied research project was to identify the regulations, elements, and training needed to develop and implement an effective RIC/RIT program for the Reno Fire Department. Operating without a formal RIC/RIT program has subjected Reno fire fighters to unnecessary risk and leaves Reno incident commanders without the tools needed to effectively control an incident in which a member of the department becomes lost, trapped, or injured.

The recommendation from this research is that the City of Reno Fire Department, in order to create a safer fire ground work environment, provide incident commanders with the needed management tools, and comply with federal regulations and standards, must develop and implement a RIC/RIT program as soon as possible.

In developing the RIC/RIT program for the Reno Fire Department, the latest 2002 Editions of NFPA 1500-*Standard on Fire Department Occupational Safety and Health Program*, and NFPA 1561-*Standard on Emergency Services Incident Management System*, should be used as the primary guideline in developing the program. The research found that the Phoenix Fire Department has developed excellent procedures relating to RIC/RIT in compliance with the new NFPA codes. It is recommended that the Reno Fire Department not try and reinvent the wheel but, instead, modify and build on the Phoenix procedures to fit the needs and objectives of the Reno RIC/RIT program.

The research also found that a RIC/RIT is only one interrelated and interdependent element needed to effectively manage an emergency incident in which an emergency worker is

lost, trapped, or injured. To have an effective RIC/RIT program, all of the elements required to effectively manage an entire emergency incident need to be in place. The research identified and listed the required elements for an effective RIC/RIT program. It is recommended that in developing a RIC/RIT program, all identified elements be incorporated into the program and into the operating procedures of the Reno Fire Department.

Finally, it is recommended that the Reno Fire Department administration and command staff support and promote the development and implementation of a RIC/RIT program to the level necessary to achieve the successful cultural change of an effective RIC/RIT program. The support necessary to achieve this change follows: commitment of personnel and resources to develop the program and training curriculum (much of program development and training curriculum was developed through this applied research project), a minor purchase of additional RIC/RIT supplies and equipment, and allocating training time and training personnel necessary to delivery a department wide training program using the RIC/RIT curriculum.

An area identified during this research for future study and possible standards development follows. Much of the reviewed literature recommends the RIC/RIT carry an additional air supply for the lost, trapped, or injured fire fighter. This air supply can be in the form of an additional SCBA unit, some form of special RIC/RIT pack with air bottle, regular and mask, a special “transfill” connection for transferring air from pack to pack, or simply an additional air bottle. The problem is, how does the RIC/RIT supplement the air supply of a downed fire fighter and not compromise the air supply of either, or both, the RIC/RIT or the downed fire fighter? Both NIOSH and NFPA do not permit buddy breathing or the sharing of a single air supply between fire fighters (NFPA 1981, 2002). NFPA, in its 2002 edition of NFPA 1981-*Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire and*

Emergency Services, has established requirements for a Rapid Intervention Crew/Company Universal Air Connection System (RIC UAC). The RIC UAC is a system that allows emergency replenishment of breathing air to the SCBA of disabled or entrapped fire or emergency services personnel NFPA states

> This RIC UAC does not take breathing air from an SCBA being worn by a member of the rescue operation but replenishes the victim's breathing air cylinder from a source of "rescue breathing air" such as a rescue breathing air cylinder or a high-pressure breathing air supply line. The RIC UAC is not a "buddy breathing" device, as it does not permit the sharing of a single SCBA breathing air source between two persons. NIOSH does not permit or certify any "buddy breathing system" that would allow two users to share a single breathing air source. Because NFPA 1981 requires NIOSH certification as a prerequisite to become certified as compliant with NFPA 1981, NFPA cannot permit "buddy breathing systems" as this would be in violation of NIOSH regulations (NFPA 1981, 2002, p.2).

NFPA's new RIC UAC addresses this compromised air supply problem well and safely. However, today almost all modern SCBA manufacturers are offering some type of device or system as an option on their latest NFPA certified SCBA models that allow the sharing of a single breathing air source. These optional devices are considered accessories and are covered under the 2002 edition of NFPA 1981, sections 6.5.1 and 6.5.2 that state:

> **6.5.1** Any accessories attached to SCBA shall not interfere with the function of the SCBA or with the function of any of the SCBA's component parts.

6.5.2 Where SCBA are provided with an accessory or accessories that are attached to or integrated with the SCBA, the SCBA, with accessories installed, shall meet all of the design and performance requirements of this standard. In all cases, such accessories shall not degrade the performance of the SCBA.

It is the author's opinion, that these optional accessory devices, which allow the sharing of a single breathing air source, interfere with the function of the SCBA and do not meet the design and performance requirements of the 2002, NFPA 1981 standard. Yet these devices are offered, are readily available, and can be installed on an NFPA certified SCBA by the manufacturer without affecting the SCBA's certification. These buddy breathing devices are not certified nor are there any approved methods or standards on buddy breathing (Coleman, 2002). This is an important and dangerous loophole in the standard that needs to be addressed.

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